

**ABSTRACT****“Beam Synthesis Method for Downlink Beamforming in FDD Wireless Communication Systems”**

A method for downlink beamforming in a frequency-division-duplex wireless communications system comprising a base station with an antenna array and terminals that are physically remote from said base station, the method comprising the steps of: receiving at said base station antenna array combinations of arriving uplink signals from said plurality of remote terminals, estimating an uplink beamforming weight vector for each of said terminals from said combinations of arriving uplink signal; identifying uplink nulls and an uplink main beam position from said uplink beamforming weight vector; transforming each of said uplink nulls to form a corresponding downlink null; generating a downlink beamforming weight vector from all downlink nulls; and transmitting a set of information signals from said base station antenna array according to said downlink. beamforming weights.